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J. Douglas
4/14/03



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Charles B. DIETERICH

Appl. Serial No. 09/588,276

Filed: June 6, 2000

For: **BITSTREAM TESTING METHOD AND
APPARATUS EMPLOYING
EMBEDDED REFERENCE DATA:**

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: Art Unit: 2614

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: Examiner: Trang U. Tran

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: Confirmation No. 8138

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Certificate of Mailing Under 37 C.F.R. §1.8(a)

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March 24 2003
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Jacqueline D. Bailey
By:

DECLARATION OF MICHAEL ISNARDI UNDER 37 C.F.R. §1.132

I, MICHAEL ANTHONY ISNARDI, HEREBY DECLARE AND SAY:

1. I am an inventor named in U.S. Patent No. 6,400,400 issued June 4, 2002, entitled "METHOD AND APPARATUS FOR AUTOMATED TESTING OF A VIDEO DECODER" as is Charles Benjamin Dieterich, the inventor in the captioned U.S. Patent Application No. 09/588,276 filed June 6, 2000, and entitled "BITSTREAM TESTING METHOD AND APPARATUS EMPLOYING EMBEDDED REFERENCE DATA."
2. I am employed by Sarnoff Corporation located in Princeton, New Jersey, to which my U.S. Patent No. 6,400,400 and the captioned U.S. Patent Application are assigned.
3. I was awarded the Doctor of Philosophy degree in Electrical Engineering by the Massachusetts Institute of Technology in 1986. My doctoral dissertation is titled "Modeling the Television Process" and relates to computer simulation of the operation of television cameras and displays and of the video processing intermediate cameras and displays.

4. I have been engaged in research and development relating to video processing and compression for over sixteen years, i.e. since I joined Sarnoff Corporation in 1986. I am the author of many technical papers and articles relating to the subject of video processing and compression, and am a named inventor in about thirty Patents and Patent Applications relating to the subject of television, video processing and/or compression.
5. The invention described in my U.S. Patent 6,400,400 (the "Isnardi et al Patent") relates to a method and apparatus for automated testing of a video decoder wherein a test bitstream is applied to a decoder under test (DUT) 120 and to a reference video decoder 130. The decoded output from decoder under test (DUT) 120 is compared to the decoded output from reference decoder 130 by video output analyzer 140. Reference video decoder 130 is known to be compliant with a particular coding standard, e.g., MPEG-1 or MPEG-2 or ATSC. Video decoder (DUT) 120 is a decoder to be tested for compliance with the particular video standard, and may be considered a "black-box" decoder without knowing the particular implementation thereof.
6. The apparatus and method described in the Isnardi et al Patent must respond to problems arising because two video decoders (reference video decoder 130 and test video decoder (DUT) 120) are required, such as:
 - (1) Inaccuracies introduced by differences in the post-processing of the two video decoders 120, 130.
 - (2) Synchronization and processing delay differences between the two video decoders 120, 130.
 - (3) Errors introduced by inaccuracies in the IDCT process of the video decoder 120 and/or 130.These problems arise because of differences between the implementations of video decoding under the particular coding standard by each video decoder.
7. Figures 2 and 3 of the Isnardi et al Patent are directed to determining and compensating for the effects of the post-processing of decoded video by decoder under test 120, e.g., in its post-processing section 210. Post-processing section 212 follows reference decoder 130 to "mimic" the effect(s) produced by post-processing section 210. To avoid the need for information about post-processing section 210, intra-coded areas 310 are inserted into one or more frames of the test bitstream so that the decoded video of intra-coded area 310 produced by decoder under test 120 may be compared to the decoded video of intra-coded area 310 produced by reference decoder 120, i.e. by analyzer 140, to produce data from which post-processing section 212 is calibrated to mimic post-processing section 210.
8. The Isnardi et al Patent describes in relation to Figures 2 and 3 the comparing of the decoded intra-coded area pixels produced by video decoder (DUT) 120 (and its post-

processing section 210) to the corresponding decoded intra-coded area pixels produced by reference decoder 130 (and post-processing section 212), including the pixels of reference area 330 and macroblock 340. This comparing is on a pixel by pixel basis to determine the error introduced by post processing section 210 so that post-processing section 212 may be made to produce the same error. As a result, pixels in actual data area 320 produced by decoder (DUT) 120 may be compared to corresponding pixels in actual data area 320 produced by reference decoder 130, i.e. by analyzer 140.

9. The Isnardi et al Patent describes having a bitstream decoded by two separate video decoders and then comparing the decoded video produced by one video decoder against the decoded video produced by the other video decoder. The Isnardi et al Patent does not describe comparing one part of a picture decoded by a video decoder to another part of that picture decoded by that video decoder.
10. To my knowledge and experience, the apparatus and method described in the Isnardi et al Patent do not include differently coded portions of a reference picture that are to be compared and so do not describe the "at least one picture includes a region that is a direct-coded representation of the reference image portion and a region that is an indirect-coded representation of the reference image portion" as recited in the claims of the above-captioned U.S. Patent Application.

All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code (18 U.S.C. §1001) and may jeopardize the validity of the patent application or any patent issuing thereon.

Declarant: MICHAEL ANTHONY ISNARDI

Signature: Michael Anthony Isnardi

Date: 3/13/03